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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,317

Applicant(s)

KOBAYASHI ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 17, 19-23, 26 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-16, 18, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on January 11, 2006, which has been entered into the file.
- By this amendment, the applicant has amended claims 11, 12, and 15-16.
- **Claims 1-10, 17, 19-23 and 26-27 are withdrawn** from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on **July 28, 2005**.
- Claims 11-16, 18 and 24-25 remain pending in this application.

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the *image generator recited in amended claim 12* must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Amendment

2. The amendment filed on January 11, 2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **the amended claim 11**, recites the phrase “allocating two or more of the input image to each image display regions of an image display device” and **the amended claim 12** recites “two or more of the input images being allocated to each of the image display regions”. The specification never discloses to have two or more images allocated in a single display region **at one time**. The different images for different views can only be input to the same image display region one at a time.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 11, 12--16, 18, and 24-25 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the paragraph above.

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5. **Claims 11, 12–16, 18, and 24-25 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was **not** described in the specification in such a way as to **enable** one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The amended claims 11 and 12 fail to enable stereoscopic or three-dimensional image viewing. Claims fail to disclose what are these image of multiple viewpoints in relating to provide stereoscopic viewing and the claims fail to provide what are these multiple viewpoints in order for one to view a stereoscopic image. The claims also fail to teach what are these two or more input image in relating to view stereoscopic image. The method and apparatus therefore are not enabling.

The amended claims 11 and 12 fail to teach how to “switch” to display one of the images **allocated** in the same display regions to be displayed.

The amended claims 11 and 12 also fail to teach how could the light deflector is capable of deflecting images from the same display regions to different viewpoints. If the images are from the same display region then they can only be deflected to the same viewpoint, unless other mechanism which is not disclosed involved to deflect them to different viewpoints. At this juncture, the method and apparatus are not enabling to deflect images of different viewpoints from the same display region to different viewpoints. However images of different viewpoints are being allocated in the same display region, this makes the apparatus and method not operable.

Claim Objections

6. **Claims 11, 12-16, 18 and 24-25 are objected to because of the following informalities:**

(1). The amended claims 11 and 12 recite to allocate two or more input images in a display region, that is confusing and indefinite since it is not clear what is this display region that allow two or

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more images be allocated within and how does the switching be done to make just one of the image allocated in the display region to be displayed?

(2). The various symbols “L”, “m” recited in claims 13-15, (with regard to amended claim 12), are confusing and indefinite since it is not clear what are these symbols stand for? The scopes of the claims therefore are not definite.

(3). The amended claim 12 recites the display device has multiple display regions and claim 13 recites the image display device has a display area divided into sub-regions. It is really not clear how do these display regions relate to the sub-regions?

divided images? How are they relate to the right eye images and left eye images and the multiple views necessary for making the stereoscopic image display. Clarifications are required.

(4). The phrase “light image” should read as “image light”. Light does not have image by itself. **The applicant is respectfully reminded that light could be encoded with an image information, but light does not have an image. But images are generated by light.**

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 11-12 and 14, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Popovich (PN. 6,101,008).**

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Popovich teaches an *autostereoscopic display* that is comprised of an *image generator and display device* (12, Figure 3), for generating and displaying a plurality of input images each corresponding to one of multiple viewpoints (i.e. for different viewers 70 and 72). It is implicitly true that the input images for different view points are allocated in the same display regions in a *time sequential manner* such that the image generator is configured to switch one of the images corresponding to one of the viewpoints to be displayed. The autostereoscopic display further comprises a stack of switchable holographic elements (54-60) that serves *both* as the image separator and deflector for separating the image projected from the image generator to left eye image and right eye image (62, 64 or 66, 68) for an observer (70 or 72) and for deflecting these images to the particular observer or viewpoints, (please see columns 7-8, Figure 3). The switchable holographic is activated or switched in synchronization with respect to the display of the images for different observer.

With regard to claim 14, the number of directions of optical deflections is at least four for two observers and two eye locations for each observer, m then equals 4.

With regard to claim 16, the deflection is in synchronization with the switching of the display of the images for different observers.

With regard to claim 18, it is implicitly true that the image is rewritten collectively at all pixels of the image generator for presenting images of different viewpoints.

This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 11, 12-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Son et al (PN. 6,229,561).

Son et al teaches a *multi-view three-dimensional image system* that enables a plurality of observers to view three-dimensional images wherein the image system comprises a *display device* (15, Figure 1, or 40, Figure 6) positioned at a prescribed distance from multiple viewpoints (6 or 34), an *electro-optic switch* (13-1, Figure 1) or *scanner* (43 and 44 Figure 6) serves as the *image separator* positioned on the viewpoint side of the display device, and a *holographic screen* (4, Figure 1 or 33 Figure 6) serve as the *light deflector* to deflect the image light separated by the image separator and to guide the image light to multiple viewpoints, (please see Figures 1 and 6). The image display device receives a plurality of input images that each correspond to one of the multiple views, (output signal, Figure 3). The input images have been converted by a signal converter (2) to have the image format of *spatially time divisional images* (please see the spatial and time divisional image frames, Figure 3). *The electro-optic switch* (13-1) is used to *separate* the image light into left eye image and right eye image and the *holographic screen* (4) serves to *deflect* the optical paths of the left eye and right eye images to left eye and right eye (8, 9) at different and multiple view points (6), respectively, to enable stereoscopic view, (please see the abstract and columns 4-5).

Claims 11 and 12 have been amended to include the feature that the display device is having multiple display regions such that two or more of these input images are allocated in each of the display regions and the display is configured to switch said two or more images at a certain timing to display one of the said two or more images. Son et al teaches that a train of signals, (i.e. time sequentially presented image signal) to generate output of the signal from the signal converter is provided to display panel, (please see column 6, lines 13-36), this suggests that images for different viewpoints can be allocated in time sequential manner to the same display regions on the display panel so that image of different

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viewpoints can be separated by the synchronize switching of the switch and be deflected by the holographic screen to different viewpoints in synchronized fashion. With regard to claim 12, Son et al does teach to include an image generator to generate multiple input images, (please see Figure 1).

The features concerning the “L” and “m” recited in claims 13-15 are confusing and indefinite, they can not be examined since the claims fail to define what they are. With regard to claim 13, Son et al teaches that the image separator is an electro-optic switch with transmissivity of the vertical slits varying in pitch, and it is implicitly true in order for all the spatially divided image portion being transmitted, the pitch must equal to the number of the spatially divided image times the width of each of the spatially divided image portion. The electro-optic switch (13-1) or the scanner, serves as the image separator is achieved by switching *different* vertical strips (14, Figure 1(b)) ON and OFF to change the transmissivity of the strips in sequence of time in accordance with the image displayed on the display device so that the left eye and right eye image are separated for different viewpoints.

With regard to claims 14-16, the number of the deflection directions, which is responsible for the providing the multiple views equal to the number of multiple views provided. It is implicitly true that the number of input images should equal to the number of spatial division and the time division of the image. With regard to claim 16 the image displayed on the display device has to be synchronized with the separator and the deflector.

With regard to claim 18, it is implicitly true that the image is re-written at all pixels of the display device.

11. Claims 11-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nose et al (PN. 5, 966,167).

Nose et al teaches a *stereoscopic display device* that is comprised of a *display device* (3, Figure 6) disposed at prescribed distance from multiple viewpoints, a *lenticular lens* (5) serves as the *image*

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separator, disposed at viewpoint side of *display device* for *separating* the spatially divided image into left eye and right eye image light, and a *variable apex angle prism* (13) serves as the *light deflector* for deflecting the image light from the image separator into different viewpoints, (please see Figure 6).

Claims 11 and 12 have been amended to include to include the feature that the display device is having multiple display regions such that two or more of these input images are allocated in each of the display regions and the display is configured to switch said two or more images at a certain timing to display one of the said two or more images. Nose does not teach such explicitly. However the arrangement can easily be modified to allow *time sequentially* prepared images, such as *continuous scenes*, be presented to the display device, certainly at same display regions, in time sequential manner so that the display device can be configured to switch different images of the different scenes to be displayed at certain timing to provide continuously viewing images. With regard to claim 12, an image generator to generate multiple input images must be included, (please see Figure 1). As for the multiple viewpoints, Nose particularly teaches that the images be viewed at different viewpoints, (please see Figure 6), this suggests that the image content can be modified to specifically prepared for viewing at different viewpoints.

With regard to claims 13-16, the lenticular lens has *pitch* that *equals* the sub regions of the spatially divided image times the number of the spatially divided image. The number of deflection direction equals the number of the time division of the image, (such as two for view points 6a and 6b). The total number of input images therefore equals the number of spatially divided image times the number of time divided image, (i.e., four images for two viewpoints 6a and 6b, two for each spatial division and two for time division). The switching and therefore changing the deflection direction of the prism or deflector has to be synchronized with the rewritten of the image, (for view points 6a of 6b).

With regard to claim 18, the rewritten of the image has to be for all pixels of the image display device.

12. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Son et al in as applied to claim 12 above, and further in view of the patent issued to Moseley et al (PN. 6,611,243).

The three dimensional image display system taught by Son et al as described for claim 12 above has met all the limitations of the claims. Son et al teaches the image display device (15) is within an image projector system (3) and the display device is a *liquid crystal panel*, (please see column 4, lines 1-5). However this reference does not teach explicitly that the projector is comprised of a light bulb with an aperture controlling part such as a microlens. Moseley et al in the same field of endeavor teaches an image projection system in a stereoscopic image display device wherein a *backlight source* (1) with a *microlens* (3) is used to *illuminate* a spatial light modulator, which may be a *liquid crystal display panel*, for generating the desired stereoscopic image pairs, (please see Figure 13). It would then have been obvious to one skilled in the art to apply the teachings of Moseley et al to modify the image projector and the image display device of Son et al by having the specific backlight source and microlens arrangement for the benefit of providing the control of generating the desired stereoscopic image pairs for displaying.

13. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nose et al as applied to claim 12 above, and further in view of the patent issued to Moseley et al (PN. 6,611,243).

The *stereoscopic image display device* taught by Nose et al as described for claim 12 above has met all the limitations of the claims. Nose et al teaches that the display device (3, column 6, lines 48-50) is a liquid crystal display device, but it does not teach explicitly that the liquid crystal display device is of projection type with light bulb and an aperture controlling part such as microlens. Moseley et al in the same field of endeavor teaches an image projection system in a stereoscopic image display device

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wherein a *backlight source* (1) with a *microlens* (3) is used to *illuminate* a spatial light modulator, which may be a *liquid crystal display panel*, for generating the desired stereoscopic image pairs, (please see Figure 13). It would then have been obvious to one skilled in the art to apply the teachings of Moseley et al to modify the image display device of Nose et al by having the specific backlight source and microlens arrangement for the benefit of providing the control of generating the desired stereoscopic image pairs for displaying and for making the stereoscopic image display suitable for projection type of image display.

14. Claims 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Popovich (PN. 6,101,008).

The *autostereoscopic display* taught by Popovich as described for claim 12 above has met all the limitations of the claims.

With regard to claim 13, the holographic elements serve as the image separator is based on variation of index of refraction. Popovich does not teach about the sub-regions of the display device and does not teach about the size and the pitch of the variation of the index of refraction. However claim 13 fails define these sub-regions and the expression they really cannot be examined here.

With regard to claim 15, the expression recited in claim 15 is not defined and it really cannot be examined here.

15. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Popovich, in view of the patent issued to Moseley et al (PN. 6,611,243).

The *autostereoscopic image display device* taught by Popovich et al as described for claim 12 above has met all the limitations of the claims. Popovich et al teaches that the image generator and display device (12, column 6, lines 48-50) is a projection device, but it does not teach explicitly that the display device has light bulb and an aperture controlling part such as microlens. Moseley et al in the

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same field of endeavor teaches an image projection system in a stereoscopic image display device wherein a *backlight source* (1) with a *microlens* (3) is used to *illuminate* a spatial light modulator, which may be a *liquid crystal display panel*, for generating the desired stereoscopic image pairs, (please see Figure 13). It would then have been obvious to one skilled in the art to apply the teachings of **Moseley** et al to modify the image display device of **Popovich** et al by having the specific backlight source and microlens arrangement for the benefit of providing the control of generating the desired stereoscopic image pairs for displaying and for making the stereoscopic image display suitable for projection type of image display.

Information Disclosure Statement

16. The information disclosure statement filed November 10, 2005 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Response to Arguments

17. Applicant's arguments filed on January 11, 2006 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and addressed and they are rejected for the reasons stated above.

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Applicant's arguments concerning the newly added features have been fully addressed in the paragraphs above.

In response to applicant's arguments which state that the cited Son reference does not teach separation of image light the examiner respectfully disagrees since if this is the case how could the left eye and right eye image lights be directed to the left eye and right respectively?

In response to applicant's arguments which state that the cited Nose reference teaches the deflection is to direct the images to the same eyes, which therefore differs from the instant application the examiner respectfully disagrees. The claims do not claim to be the same eyes or not which therefore makes the feature not reliable to overcome the rejections. Further, whether it is viewed by the same eyes or not, the cited Nose does teach explicitly to deflect light via different optical paths to different viewing points or viewing positions, which satisfies the claim language.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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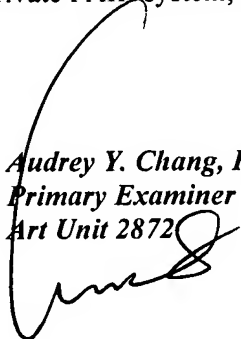
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.